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On Johne's Disease*

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There are so many unknowns about Johne's disease that our stage of advancement is not very far removed from that of the College of Physicians in the seventeenth century, when their pharmacopoeia included a "plague water" containing 21 ingredients. The one fundamental fact which is known is that the presence of the causal organism is essential. But *M. paratuberculosis* alone does not cause disease and the contributory factors are still a subject of conjecture. It is believed that the parasite gains entrance by the mouth because attempted infection by other channels has consistently failed whereas drenching succeeds sometimes; but it is not known with certainty how and when implantation into the gut wall and a few lymphatic glands occurs, nor what else is required to cause a breakdown in health. No successful curative treatment has been reported yet. Until these problems are resolved, control measures must be directed principally towards preventing encounters between the host and the parasite throughout their respective lives.

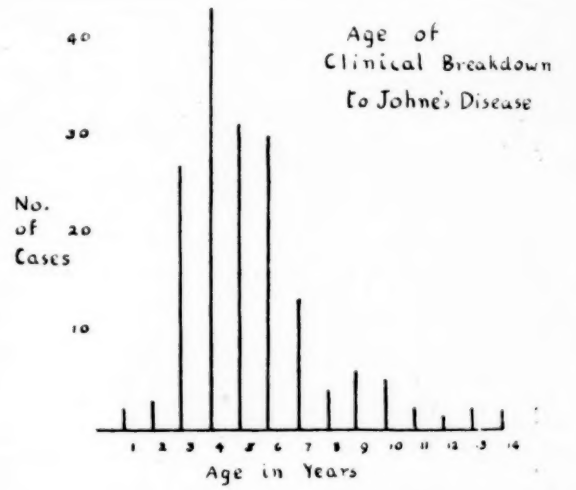
When does an animal become infected under field conditions? It has frequently been reported that, experimentally, it is difficult to infect a calf over six months of age. If this obtains in nature, then the attention paid to pasture and drinking water is not designed to prevent infection.

There is some evidence that the disease can be congenital. Dunkin (1934) reports an interesting case of a bull calf out of a known infected cow. The utmost care was taken at birth to avoid external contamination. The calf was caught into a sack, removed, reared in strict isolation on a farm believed to be free from the disease. He reacted to a johnin test at six months and subsequently grew into the Johne's disease type, light behind, and, as a three-year-old, had two spells of scouring with acid-fasts in the faeces. His eventual fate is not recorded. Dunkin also quotes the finding by Alexijeff-Goloff of Johne's bacilli "in a foetus *in utero*, in a newly-born calf and also in the milk of three cows." Allowing that congenital transmission can occur and that dam and offspring combinations are frequent, it seems probable that the explanation of these latter is to be found in a direct transmission within a few days of birth rather than on congenital or heritable lines.

I have studied the ages of clinical breakdown to Johne's disease in four herds producing a total of 171 cases. The date of death or disposal is that recorded as "breakdown" and, in these herds, would follow soon after the first observed clinical signs. The peak age of breakdown is four and the mean five years, so that if infection normally occurs within six months of birth there is an expectation of four and a half years' tolerance before the parasite overcomes the host. The range in this series is from six months to 13¾ years. Are we to believe that cattle commonly harbour the parasite for long periods of years or do they become infected as adults?

One hundred and thirty-five cases in this series occurred in pedigree Guernseys, of which 19 were imported at ages from six months upwards and the remainder home-bred. This might provide some good evidence if the island of Guernsey were free from Johne's disease, but I do not think that it is. However, the mean age of breakdown in the imported cattle is 6·80 years as compared with 4·77 years in the home-bred, which seems to suggest that the imported stock acquired infection later in life. They might, of course, possess a higher degree of tolerance but, from incomplete figures, the reverse seems to be the case in that the proportion of imported cattle breaking down is considerably higher than among the home-bred.

Hagan (1935), in America, collected 20 calves under six months old, vaccinated half and exposed them all to very severe infection. Four deaths resulted at 8, 15, 19 and 24 months after exposure. The remaining 16 were slaughtered at about three years old and, judged on the basis of histological examination of the gut and recovery of the organism, eleven were successfully infected and five were resistant. The unvaccinated group contained three of the five resistants but the experiment was far too small and too brief to provide good data for assessing the vaccine. It is more interesting



to observe that seven of the infected cattle are described as in good or fair physical condition some two and a half years after the probable date of a heavy infection. In the absence of a good diagnostic test we are not in a position to measure the interval between infection and clinical breakdown, nor the preceding interval between exposure and actual infection, which constitutes the true period of incubation. It seems probable that the organism can become implanted early in the life of an animal and thereafter, as is true of some other bacteria and larger parasites, a state of mutual tolerance develop and continue for many years until something causes release of the trigger.

It is, I think, important to distinguish between the combination of factors which produces infection and that which later tips the balance between host and parasite, because they are not the same. To regard the infection as steadily, if slowly, progressive is to ignore phenomena frequently observed. *Post-mortem* lesions of gross type are not uncommonly found in animals which have no clinical history of the disease. Reactors to johnin, for what it is worth, have been known to live on, apparently healthy, for years. Smythe (1935), referring to Cornwall, says ". . . a considerable area along the north coast is sandy, the soil being composed principally of fine blown shell sand, with a calcium carbonate content up to 25 per cent. In these districts clinical Johne's disease is extremely rare, although lesions of the disease may frequently be found on *post-mortem* examination directed towards the detection of other conditions. When cows from this area are sold to farms in the adjoining granite region, where the soil is acid and deficient in lime, they frequently break down within a few weeks—far too early for the infection to have been introduced from their new surroundings." In the autumn of 1945, twelve first-calf Shorthorn heifers were moved from east to west Kent and calved during the winter. The farm to which they were moved is known not to have had a case of the disease over a period of many years. The source farm has not been observed so closely but it is believed that disease does not exist there in clinical form. Five of the 12 broke down within six months of the movement, diagnosis being adequately verified in life and on *post-mortem* examination. From this kind of experience it is a reasonable assumption that the infection complex and the breakdown complex are not identical, but it is very difficult to study them separately under field conditions because the first is seldom recognized until the second occurs. So the belief that infection takes place only in the very young rests on experimental evidence which cannot readily be confirmed or refuted by field observation. Until the contrary is proved it is sound to act in practice as though adult cattle were susceptible and advise measures to prevent or limit their exposure.

Many breeders believe that a susceptibility to Johne's disease is inherited and, when challenged, will quote impressive instances, tracing back to a foundation cow. I have attempted to check by

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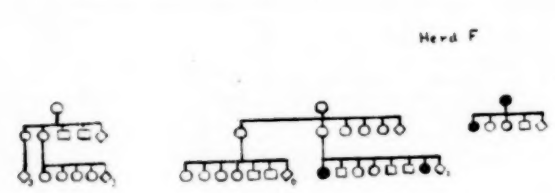
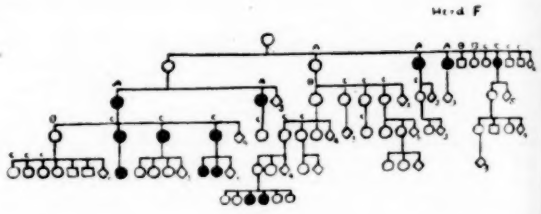
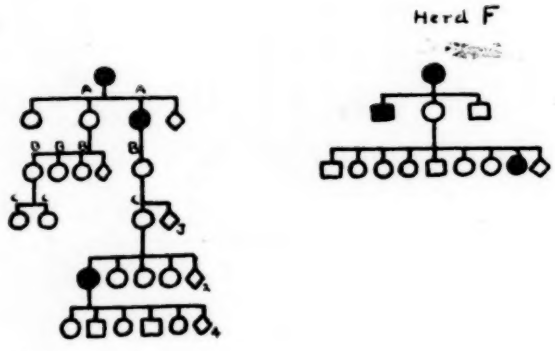
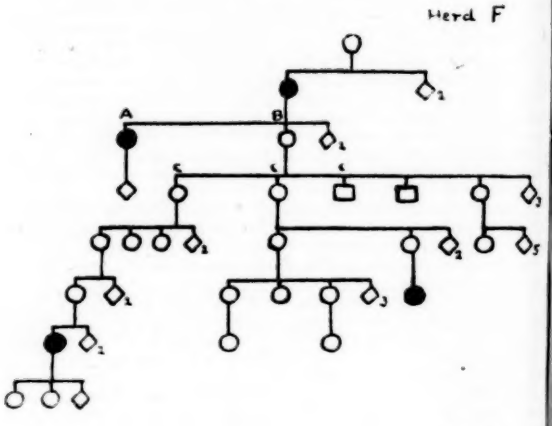
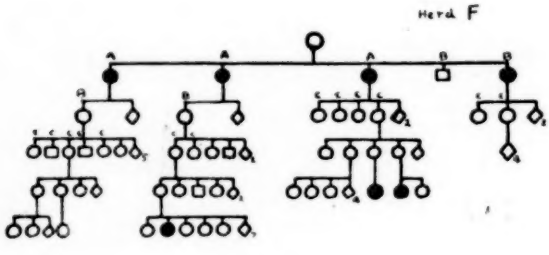
JOHNE'S DISEASE: FAMILY BREEDING CHARTS

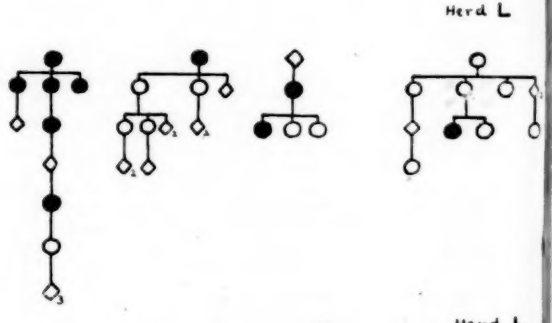


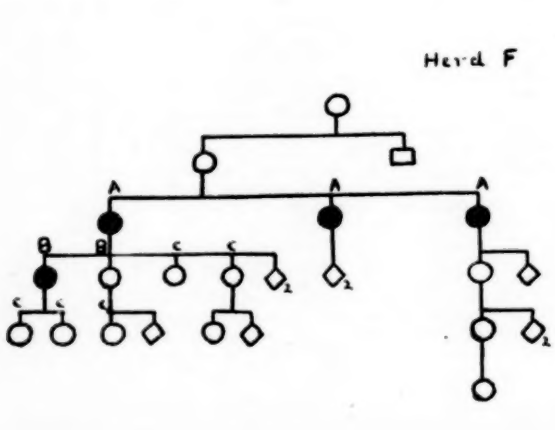


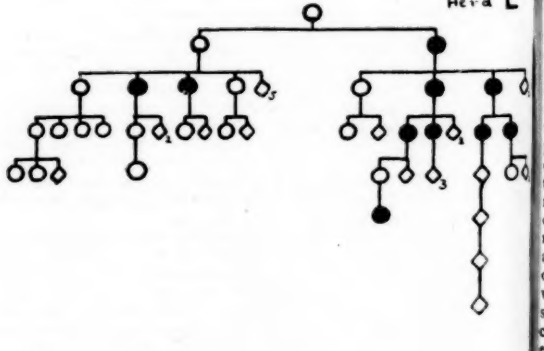


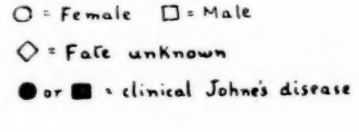












examining the records, not only of a particular line, but of the whole herd contemporaneously. Illustrative charts from two herds are submitted. In compiling these an arbitrary minimum age of five years has been adopted to qualify an animal for charting individually as not showing the defect. Anything disposed of under five is recorded as "fate unknown." There are three examples of cows having only three progeny each, all of which showed the disease, and four cases where disease passes from mother to daughter through three generations. In herd F, all the traceable progeny of three bulls are indicated. Bull A, a Johne's case himself, produced 14 qualifying daughters of which all but two showed the defect. Bull B, also a Johne's case, produced 15 progeny, of which all but two remained apparently healthy. Bull C, son of bull B, remained healthy himself and his 42 sons and daughters include only four cases.

A genetical study of cattle is a very different thing from that of small animals which have litters and a short generation and which can be interbred for the one purpose of concentrating a genetic character. Such studies relating to infectious disease have the added complication of the direct transmission of the causal organism from mother to progeny. So it is of little avail to look for patterns in these charts suggestive of a Johne's disease diathesis. From the illustrations one can appreciate how a breeder forms an opinion, even a conviction, and he may be right, but not on this evidence. There is an extensive literature on genetic studies of infectious diseases in animals and man and it may be summed up by saying that response to exposure is notably affected by genetic constitution. But if one is asked to advise whether to avoid breeding from alleged Johne's disease lines, I think the answer is quite clear. It is so difficult to breed successfully for the known heritable characters such as conformation and milk-yield that it would be very unwise to permit such an unmeasured factor to interfere with a breeding programme.

Another opinion widely held is that the Channel Island breeds are particularly susceptible. In the spring of 1942 the Ministry's staff conducted a brief field enquiry into the distributional incidence of three diseases in the four south-eastern counties. The data relating to Johne's disease comprise the numbers of cases acknowledged by owners to have occurred during the 12 months immediately preceding the enquiry. The figures are, therefore, minimal and have little or no absolute value, being intended only to furnish a distributional index. For what they are worth, the results do not confirm the current impression that the disease is particularly prevalent among the Island cattle. Incidentally, 10·1 per cent. of all the herds admitted to having the disease.

FIELD ENQUIRY INTO DISTRIBUTIONAL INCIDENCE OF JOHNE'S DISEASE

COUNTIES OF KENT, SURREY, SUSSEX (E. & W.), 1942

	Cattle	Johne's cases	Per cent.
Total	52,071	170	0·32
Guernsey	3,118	5	0·21
Jersey	692	3	

Attention has been directed towards trace elements for many years in the hope that effective means of preventing infection or delaying clinical breakdown may be found in this group. Liming the land and feeding mineral mixtures are regularly advocated and beneficial results have been claimed. The practice is probably sound but on a general and not a specific basis. It is well known that illness, perhaps of a minor and fleeting character, is often the precursor of clinical breakdown to Johne's disease, so that measures designed to maintain general health are good. But there have been too many failures to influence the course of the disease by artificial raising of the calcium intake to leave any conviction that Johne's disease and calcium metabolism are closely connected. Dryerre noted a haemoglobinaemia in clinical cases and suggested the administration of iron. More recently, Michael (1946), recording observations on the disease in sheep in North Wales, associated it with a deficiency in cobalt although recognizing a cobalt-deficiency syndrome by itself as well as coupled with Johne's disease. The cobalt deficient areas in this country have been plotted and it is extremely unlikely that it occurs in the south-east. The fact that certain localities favour Johne's disease gives substance to the belief that an unknown factor, associated with the soil and quite likely to be mineral in nature, exerts a profound influence. The first logical step towards discovery of this unknown would be the accurate mapping of the distribution of the disease in this and other countries.

I would, however, reiterate the opinion that prevention of clinical breakdown and prevention of infection are not one and the same problem. It is quite probable that there are infected herds which do not suffer losses.

The coexistence of tuberculosis and Johne's disease in the same animal is sufficiently uncommon to have given rise to the view that, in addition to the well-known cross allergy, there is some degree of cross immunity between the two organisms. Smythe (1935) suggests that an infection with Johne's disease affords some protection against tuberculosis but not *vice versa*. On the other hand, clinical Johne's disease seems to be particularly prevalent in attested herds. The incidence before and after eliminating tuberculosis has not, so far as I know, been critically examined but there is quite a distinct impression that the one disease tends to repel the other. The observation has academic rather than practical value. Artificially induced resistance is likely to be stronger with the homologous antigen and there is now ample evidence that the subcutaneous injection of fully virulent Johne's organisms does not set up the disease. Doyle (1945) carefully checked this observation before an extensive field trial of Vallée's vaccine was undertaken in this country, so that there is every reason for attempting to repeat the French results by using the actual organism rather than a modification of the other acid-fasts. The field trial now being conducted under the Agricultural Research Council should give measurable results within ten years.

The lack of a good diagnostic test is severely felt when one is confronted with the problem of advising the owner of a heavily infected herd. Johnin, even in its modern refined form, produces far too many anomalous results to be employed with confidence. Some success has been achieved in clearing the Compton herds by its use but the ordinary farm could not provide comparable facilities nor afford the inevitable mistakes of diagnosis. Edwards (1946) recommends simultaneous single intradermal injections with avian tuberculin and johnin P.P.D., 0·2 to 0·4 mg./c.c., reading at the 72nd hour only, to distinguish between the avian sensitivity, common in young stock, and a true johnin sensitivity. Possibly the Stormont observations of Lamont and his colleagues (1946) on tuberculin sensitivity point towards a preliminary desensitisation with mammalian and avian tuberculins followed by johnin, as a cumbrous but still practicable test. The microscopical examination of a direct smear of faeces is far more fruitful of positive results than is generally known and the possibility of confusion with other acid-fasts is not great. Admittedly, the negative result is valueless and sampling would require to be repeated several times. From individual cases this method is within reach of the practitioner but, for herds, the assistance of a laboratory would be required and probably a concentration technique.

Experience during the war seems to show that a considerable measure of control is in the farmers' own hands. Following the control of meat prices at a fairly high level the number of "wasters" from all causes diminished notably. If owners watch closely for the first faint signs of Johne's disease, change in conformation or colour, or the slight inter-maxillary oedema, and dispose of such animals before the output of organisms reaches a peak, a great improvement is effected. But such methods do not eradicate the disease and I think we shall have to be satisfied with something less until someone provides a good diagnostic test, a real preventive or a cure. The well-known measures are not based entirely on guesswork and hope. If the early months and especially days, of life are the most dangerous, it is logical to remove the calf at birth. If, as seems probable, adults can become infected, and in view of the years of tolerance during which an infected animal is almost certainly discharging organisms, then a well-drained pasture is good for the host and bad for the parasite. The full benefit of that greatest of all public health inventions, the drain pipe, is denied to us because no one can teach a cow to pull the chain, so a piped drinking water is indicated. Lime improves most land, assists in providing a better level of nutrition for the stock, tending to avoid minor maladies and perhaps to delay breakdown.

A great difficulty about Johne's disease is that it is among the lowest grade of the infectious group, like leprosy, and so is not easy to manipulate for study. But, as with all infections, it is not necessary to achieve absolute protection to win success. All that is needed is to render conditions a bit more favourable for the host and a bit less for the parasite and nature does the rest, although we may not understand exactly why or how.

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Opening of Discussion by Mr. John Pasfield

Our distinguished and familiar speaker has compared our present knowledge of Johne's disease to that of the Royal College of Physicians in the days of the Great Plague. It is an undoubted fact that in the multitude of remedies there is no certain cure, nor indeed much secured knowledge.

But I take consolation from the fact that, even in these days (when much progress seems to be backward instead of forward), at least we have abandoned the scatter-gun remedies that were fashionable in earlier days. The infusion of aloes, the sulphate of iron, hydrochloric acid, all these have disappeared into alchemy. We acknowledge to-day that we are in the presence of a killing disease, one which is not smothered by the so-called astringents, nor yet by the newer sulphonamide groups, which have proved of such great value in the less deep-seated forms of diarrhoea and dysentery. We are not so concerned with the treatment of the disease, as in its effective control and especially with the diagnosis of pre-clinical cases and infected cattle.

Our speaker has not taken the time of the meeting by detailing those symptoms with which we are all acquainted, or by reiterating the teaching of the schools that Johne's disease, having an incubation period of about two years, and being contracted at an early age, is therefore manifested clinically in the second and third years of life. While it is true that a great many cases are observed at this phase, and that in commercial herds the clinical incidence of the disease is at its greatest during the third year of life, the present marked increase in pedigree breeding has brought it to the knowledge of us all that the condition may appear at almost any adult age, especially among the Channel Island breeds.

We are not yet concerned with the cure of the condition, though I have no doubt that one day the cure will be found. But before this time arrives, we must have found a fair rule of thumb to enable us to concentrate on suspected cases; the transmitters of the disease; those animals in whom only the release of the trigger is necessary to produce the clinical symptoms. Otherwise we shall discredit our cure when it appears, by its application to the incurable or the moribund.

What releases the trigger? Undoubtedly the act of calving is the greatest single factor. Perhaps the addition of a retained placenta with consequent manipulation is the deciding factor (though it is well observed that the animals which break down at this phase have a history of making an unsatisfactory udder towards parturition, and in general have not approached this act with that freshness which stockmen expect when reasonable rations are fed); sometimes the trigger mechanism is actuated by prolonged under-nourishment, sometimes by the nebulous chill, sometimes by fulminating mastitis.

I suggest that the breakdown mechanism is closely akin to that obtaining in clinical tuberculosis, *viz.*:—

(1) The massiveness of the initial infection.

(2) The virulence of the infecting strain.

If it is claimed that all field strains of *Mycobacterium paratuberculosis* are identical, this will not tally with herd histories made from farm to farm.

(3) Such additional factors as nutrition, additional disease or accident and, finally, breed.

What gives to the Channel Island breeds the unenviable distinction of being the most prone to contract Johne's disease?

(1) Their metabolism balances on such a fine thread that the acetonaemia complex is a normal occurrence. The premonitory symptoms of Johne's disease are practically always accompanied by acetonaemia.

(2) They are generally incapable of responding to force feeding with concentrates for any considerable length of time.

(3) Their natural system of husbandry is to live on solid clay over igneous rock; to graze pastures which are permanent and which are perennially fertilized with the liquid manure from sheds in which they have spent the winter. And it has been quoted (Smythe, 1935) that Guernsey cows grazing over high calcium levels do not show the condition. In addition to this, it is known that Guernsey cows grazing over gravel subsoil do not thrive.

The detection of incubating cows presents, at this time, very considerable difficulties. The cross allergy manifested between *M. paratuberculosis* and *M. tuberculosis* suggests that the careful reading of comparative intradermal tuberculin tests over a period of years might give a pointer.

These are the tuberculin test figures of 12 Jersey cows slaughtered as confirmed clinical cases of Johne's disease, and for their compilation I have to thank our Divisional Inspector and the staff of Animal Health, Chichester. The faecal examinations were conducted by Dr. M. L. Levi, of the Research Institute in Animal Pathology, the Royal Veterinary College.

Subject	Born	18.2.41	14.8.41	18.8.42	7.10.42	24.8.43	13.12.43	17.1.44	13.6.44	17.7.44	12.6.45	11.6.46	22.7.46	Date Slaughtered
A	20.5.40	3 4 4 3 4 4	4 5 5 4 5 5	7 7 7 6 6 6		6 6 6 5 5 5	4½ 6 6½ 7 4½ 6 6½ 5							1.5.4
B	20.6.40	3 3 3 4 4 4	3 5 5 4 5 5	4 4 4 4 4 4		5 10 8 5 6 6	5½ 6½ 7½ 7 6 6 6 6½ 6		7 20 17 6 10 11					21.12.4
C	16.10.39	4 4 5 4 5 5	6 7 7 6 7 7	5 8 8 5 8 8	5½ 9 11½ 5 11 12	5 7 8 4 5 6	4½ 8 8 7 4½ 6 6½ 5							8.5.4
D	13.4.40	3 4 4 4 5 5	4 5 5 4 5 5	6 6 6 6 6 6		6 6 7 4 4 5	5 6 5½ 5 5½ 6 7 6		7 8 8 7 7 7					4.8.4
E	23.4.39	5 6 6 6 7 7	5 6 6 5 6 6	5 5 5 4 4 5		5 5 5 4 4 4	4½ 5½ 6 4½ 4 5½ 5½ 5		7 7 7 6 6 6					7.12.4
F	1.7.37	7 7 7 7 7 7	5 6 6 6 7 7	7 8 9 7 8 9		6 8 8½ 6 6 6	5 7½ 13 14½ 5 8 11½ 12							17.4.4
G	27.10.40	2 3 3 2 3 3	3 4 4 3 4 5	5 8 10 5 10 10		6 9 10 6 8 9	5 14 15 15 5½ 11 13 14							17.5.4
H	2.2.41	2 3 3 2 3 3	3 4 4 3 4 4	5 5 5 5 5 5		6 7 8 5 9 11	5 7 7 9 5 8½ 12 12	4½ 6 6 4½ 6 6	7 10 10 6 9 9	5 8 10 10 5 6 6 6				19.10.4
I	3.11.38	5 5 6 6 7 7	6 7 7 6 7 7	6 14 12 6 10 10		6 7 8 5 6 6	5½ 7 7 6 5 6 7 6		8 11 14 7 8 9					11.5.4
J	29.1.41		4 5 5 4 5 5	8 8 8 8 8 10		7 8 9 5 6 5	6 8 10½ 11 6 6 7 7		8 11 11 7 7 7		7 11 13 7 8 9	8 8 8 6 6 6		15.11.4
K	5.4.39		7 8 8 7 8 8	6 7 10 6 6 10		6 7 7 5 4 5	4½ 7 9 10 4½ 6 6 7		7 9 12 7 8 9		4 4 8 4 4 8	6 8 8 6 7 8		15.11.4
L	Oct. 1944										5 5 5 5 5 5	5 7 8 5 8 9	6 11½ 12 6 10 9	22.11.4

These figures show as much as the painstaking family disease charts compiled by the speaker. They seem to indicate that, whereas a rise to avian tuberculin is very frequently observed, either with or without a corresponding rise to mammalian, it cannot conversely be stated that a negative avian reaction denotes freedom from Johne's disease.

So far as vaccination against this condition is concerned, we have every reason to be pleased with the efficiency of the French vaccine-in-oil. Its great drawback lies in its blemishing effect. While it is invaluable in commercial herds, its use in pedigree stock, particularly among the fine skinned milking breeds, is severely limited by the fact that Johne's disease, like contagious abortion, is a subject not generally discussed among pedigree breeders, and in the small circles of pedigree breeds, I am certain that the appearance in public of cattle bearing this distinguishing mark would very adversely effect the reputation of any herd from which they came. It is possible that in time we may break down this prejudice in the same way that we have persuaded cattle breeders to co-operate publicly in the control of brucellar abortion.

I believe that considerably more work must be done on the subject of family predisposition, especially as transmitted by the stock bull. I leave this for your discussion with the observation that the practitioners in the field are the most likely men to supply the desired information.

REPORT

[City of Johannesburg. Report of Director of Abattoir and Livestock Market Department. (Period July 1st, 1945, to June 30th, 1946.)]

This report is full of useful information about the activities of the abattoir and livestock market, and one notes that the City Council in February, 1946, after considering the report from the Public Health and Social Welfare Committee relating to the control of milk supplies, decided to create two new positions of assistant veterinarian. It is the intention of the Council that the veterinary surgeons appointed to these positions shall be employed mainly in connection with the control of milk.

This reminds one of the pre-1937 days when local authorities in this country were also interested in the veterinary control of milk supplies. It is to be hoped that the City of Johannesburg veterinary public health services will not suffer the same fate as those of many British local authorities.

During the year 36,447 animals passed through the livestock market, whilst 874,528 animals were slaughtered in the abattoir. These figures show a marked reduction on the previous year. Air-driven cattle hoists are in operation at the abattoir, and electrically driven meat saws are on order. We are not told whether electricity is used in the slaughtering of the smaller animals such as calves, sheep, goats and pigs. The abattoir charges have been slightly increased for cattle, sheep and pigs.

A scheme for the regulation of the production and marketing of livestock, meat and meat products, came into force in South Africa on February 14th, 1946. Representations were made by the City Council to increase the consumers' representatives on this Board, but with no success. In view of the heavy condemnations from bruising of meat, the Minister for Agriculture appointed a committee to examine this problem of bruising of livestock in transit. It was found that the chief causes of this trouble were: (*a*) the presence of horns; (*b*) trucking cattle in low condition, and trucking of mixed cattle; (*c*) loading, overloading, underloading and careless shunting. The Director is strongly of the opinion that the de-horning of cattle should be encouraged.

Visits to dairy herds amounted to 709, and 17,020 cows were examined. The Department of Agriculture has been approached to undertake a more active policy with regard to the control of tuberculosis.

Of the live animals treated, 23 deaths were due to horse sickness. In the oxen, "lumpy skin disease" gave cause for concern, but the Council's animals escaped with only one death. Indeed, the summer has been noteworthy because of a very serious epidemic of this disease, attacking the cattle population of the high veld. It developed coincidentally with the annual onset of "three-day-stiffsickness," and the combination of these two diseases has caused dairy farmers very serious losses in regard to stock, calves and milk. By the end of the summer most herds were in a poor state to face the winter. The position was aggravated by a serious shortage of cattle food. A reappearance of "lumpy skin disease" is expected with the onset of summer weather.

D. J. A.

CLINICAL COMMUNICATION

Pethidine in Veterinary Practice

R. K. ARCHER, M.A., M.R.C.V.S.,

Uckfield

Pethidine was originally described in Germany in 1939 by Eisleb and Schaumann, their work being published along with clinical reports by Dietrich and Schafer (*loc. cit.*). It was first used as a synthetic substitute for atropine under the name of "Dolantin" or "Dolantal" and was found to be depressant to all types of muscle tissue though slightly excitant to the central nervous system. It is antagonistic to acetylcholine; has a strong analgesic effect and antispasmodic action, does not cause constipation or nausea except in large doses in ambulant patients. Batterman and Mulholland (1943) used Pethidine for post-operative pain and recorded some nausea which might be attributable to the anaesthetic used and not to the Pethidine. The drug may cause a slight respiratory depression and some fall in blood pressure, but this has not been noted as a side reaction of any consequence in practice.

In the human ambulant patient it may cause transitory dizziness. This feature, and the fact that Pethidine may be habit-forming when given over long periods to the human, does not greatly concern the veterinary surgeon. In veterinary practice the drug appears to be quite safe in shocked animals and useful for pain associated with fracture, but its main use is probably in the control of pain associated with spasm.

There would appear to be a divergence of opinion on the exact mode of action of the drug. Eisleb and Schaumann consider that there is a spasmolytic "atropine like" action in addition to analgesia, whereas Gruber *et al.* (1941) consider the entire action to be mainly analgesic. Nevertheless, there is ample evidence to show that Pethidine is particularly effective in the human being for the treatment of pain associated with spasm of smooth muscle. For post-operative pain Pethidine is strongly indicated as it is safe, does not depress the cough reflex, dries mucous secretions and is anti-spasmodic.

Administration may be by injection or by mouth. By intravenous injection it is best to prolong the actual injection over a minute or so as there is sometimes a rather alarming prostration if the administration is too rapid. This usually passes quite safely in a few minutes. In most cases intramuscular or subcutaneous injections produce quite a sufficiently rapid response. Oral dosage is of most use for prolonging the effect of injection indefinitely without revisiting frequently; and where a lesser prolonged effect is required—as, for example, in bronchial spasm. In large animals the administration of oral doses is impracticable because of expense.

Large-animal Practice

One of the most obvious and important indications for Pethidine in the large animal is the treatment of equine colic, especially the acute spasmodic form. It has been found satisfactory and useful to give as a routine measure in all colic cases an intramuscular, or, better, an intravenous dose of Pethidine, before making a detailed examination of the animal. The analgesic effect is well marked and most beneficial, developing within a few minutes of the intravenous dose and about 15–25 minutes after intramuscular injection.

It has been found, however, that if it is desired to use one of the cholinergic drugs, such as "Prostigmin," an increased dose to about 40 per cent. will be required. The use of arecoline in this connection has not been investigated. The point should also be made that there is considerable variation in the dose required by different horses to obtain efficient analgesia, and generally, blood horses will take just as large a dose as one of the heavy breeds. Up to 1,000 mgm. may usually be given without a sign of undesirable dizziness, but as yet no more than 500 mgm. has been given at one time to any horse intravenously.

Pethidine is invaluable for use before passing the stomach tube and before rectal examination in highly bred horses. In cattle the drug has been used for colic and for painful cases of enteritis. No untoward effect on milk yield has been noted that could be attributed to the drug and not to the illness under treatment. A dose of 500 mgm. to a normal lactating cow was without effect, local or general. In calving cases the drug has a place which is quite apart from that occupied by epidural anaesthesia. In the cow it produces marked analgesia, but it does not inhibit uterine contraction at all. It is of use in any case of pain associated with the act of parturition and a sufficient number of cases is awaited to try to assess its value or otherwise in prolapsus uteri, together with epidural anaesthesia. The drug is useful in calving the "nervous" heifer, which is much steadied by its use.

Small-animal Practice

The indications for Pethidine in small-animal practice are many and varied. It is hoped here to indicate some of the uses that have occurred to the writer and to suggest some as yet untried fields. In all colic cases, just as with the large animals, Pethidine is invaluable. Branwood (1943) has shown that the drug is invariably successful in alleviating pain in those conditions associated with muscular spasm, including renal colic, gallstone colic, etc. In cases of prolonged pain there seems to be no reason why Pethidine should not be continued for long periods, and in any case for some days, six-hourly by mouth.

In one case presented, the classical symptoms of strychnine poisoning were found (but no chemical diagnosis was attempted so that the cause of the condition was not proved) and massive dosage with Pethidine was decided upon. The subject was a border terrier bitch and when first seen she was given 100 mgm. subcutaneously and 10 mgm. intravenously. Within five minutes the convulsions were greatly reduced and in a further 15 minutes the bitch lay in a deeply hypnotic state but with no spasm. No other treatment was prescribed save warmth and quiet. Pethidine as one 50 mgm. tablet by mouth was continued at six-hourly intervals for 24 hours and 12 hours after cessation of treatment the bitch was normal.

Pethidine has been found of little or no value in rheumatoid conditions generally, but as mentioned above, it is useful in accident cases with shock. It has also been used for bronchial spasm by oral dosage with advantage and before radiography, especially of the viscera.

Dosage Table

The following table is intended as a general guide only, and it is noteworthy that Pethidine overdosage is apparently much less dangerous in animals than in the human patient.

Animal	Analgesic dose	Hypnotic dose
Terrier	10	25–50
Airedale	15	25–100
Horse	200–400	400–800
Cow	300–600	500–1,000

All doses given as mgm. by injection. May be repeated indefinitely provided deep hypnosis is not protracted. Oral dose for dogs 25–50 mgm. six-hourly or more.

Eisleb and Schaumann report that in the mouse the injection of one-fifth the lethal dose causes elimination of pain accompanied by the "S" sign indicative of central stimulation. The dose is comparable to one of 180 mgm. for a small dog or 2,000 mgm. for an average man.

The same effect was also noticed in the cat, presumably in comparable doses. In the human being, Andrews has observed cortical stimulation in drug addicts after doses of 300 mgm. at intervals of 1½ hours.

No excitant action has been observed in cats using therapeutic doses as for terrier dogs or slightly less, and in our hands the drug has proved a useful sedative.

Conclusion

Pethidine is a useful analgesic for many conditions, especially those associated with spasm of smooth muscle. It may be of use to control spasm in strychnine poisoning and in tetanus, but more experience of its use in this connection is wanted before any conclusion of value may be drawn.

Acknowledgment.—Messrs. Roche Products, Ltd., made a supply of 500 mgm. ampoules of Pethidine hydrochloride available to me without which it would have been impossible to try out the drug in large-animal practice. I am also indebted to Dr. F. Wrigley, of the research department of Roche Products, Ltd., for much information and help.

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Weekly Wisdom

The reward of a thing well done is to have done it.—Emerson.

ABSTRACT

[Trace Element Deficiency in Livestock in the Hebrides. Boddie, G. F. (1947.) *J. comp. Path.* **57**. 52-61.]

Maps show the areas of machair soils, mainly shell sand, in certain islands of the Hebrides: sheep and cattle grazed on, or fed exclusively on crops grown on, these soils lose appetite and develop progressive debility, but anaemia is noted only in those which become emaciated. The pastures of these soils are deficient in cobalt, though some of the soils appear to contain sufficient of this element; the copper content of the pastures is above the deficiency level. This investigation adds further to the already known "pining" areas of Scotland, and the feeding of a cobalt supplement to young stock was considered beneficial though the trial could not be adequately supervised. "Pining" in these areas has only come into prominence since the cutting up of the larger farms and the consequent restrictions of the old system of moving the stock periodically on to "curative" pastures, which are here shown to have cobalt contents varying from 0·11 to 0·40 parts per million of oven-dried material.

W.M.A.

QUESTIONS IN PARLIAMENT

Pet Animal Shops (Inspection)

Mr. Peter Freeman asked the Secretary of State for the Home Department whether he will arrange for the registration and inspection of shops keeping pet animals, in view of the unsatisfactory conditions at present in operation in the majority of cases.

Mr. Ede: In the Metropolitan police district attention is given to such shops by the police in the ordinary course of their duty. The Inspectors of the Royal Society for the Prevention of Cruelty to Animals also visit such establishments. I have no information to show that there is a case for the measures suggested, but will gladly consider any information my hon. Friend may be able to send me.

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Stray Animals (Humane Destruction)

Mr. Peter Freeman asked the Secretary of State for the Home Department whether he will allow the humane destruction of stray dogs and cats which have been found by the police after four days in place of the seven days now provided, in view of the fact that they are frequently kept in a state of starvation during this period owing to the unavailability of any suitable food.

Mr. Ede: So far as the Metropolitan police district is concerned, my information is that police stations and dogs' homes are at present adequately supplied with food for stray dogs. As regards the provinces, if my hon. Friend can give me particulars of any cases where animals have suffered in the way suggested I will have enquiry made.

Mr. Freeman: Is my right hon. Friend aware that in many cases dogs and cats are already in a state of starvation when found, and that to keep them another week without food is extremely cruel?

Mr. Ede: If my hon. Friend will give me any particulars of cases I will have them investigated, and the necessary action taken.

Sir Jocelyn Lucas: Would it not be a dangerous innovation, and involve needless destruction of many valuable pets, if their owners had not time to communicate with the police?

Mr. Ede: I have made an offer to my hon. Friend the Member for Newport (Mr. Peter Freeman). I am willing to consider most sympathetically any evidence he can bring before me.

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Performing Animals (Protection)

Mr. Nutting asked the Secretary of State for the Home Department what action he proposes to take to put a stop to cruelties perpetrated upon performing animals.

Mr. Ede: This matter is governed by the Protection of Animals Act, 1911, and the Performing Animals (Regulation) Act, 1925, and I have no reason for thinking that, in general, they do not work satisfactorily.

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Living Animals (Experiments)

Mr. Viant asked the Secretary of State for the Home Department how many of the experiments on living animals performed under the Cruelty to Animals Act, 1876, during the year 1946, were carried out with anaesthetics and how many without; and in how many cases were the animals allowed to recover from the effects of the anaesthetic.

Mr. Ede: 66,101, 1,344,372 and 57,279 respectively.

Veterinary Inspectors (Salaries)

Mr. Dodds-Parker asked the Minister of Agriculture the basic salaries in 1936, 1938 and 1946 of superintending inspectors, divisional inspectors and veterinary inspectors, respectively, of the Animal Health Division of his Department.

Mr. T. Williams: The following are the salary scales:—

1936.
Superintending Inspector—£738 12s. × £30-£953 13s.
Divisional Inspector—£634 19s. × £25-£738 12s.
Inspector—£396 17s. × £18-£634 19s.

1938.
Superintending Inspector—£850 × £30-£1,000.
Divisional Inspector—£700 × £25-£850.
Inspector—£400 × £18-£508; × £25-£700.

1946.
"Basic" Salaries (London):
Superintending Inspector—£1,200 × £50-£1,400.
Divisional Inspector—£950 × £30-£1,150.
Inspector—£450 × £25-£900.
Inclusive Salaries (London):
Superintending Inspector—£1 320-£1,520.
Divisional Inspector—£1,055-£1,270.
Inspector—£540-£1,005.

Explanatory Notes

(i) The "basic" salaries for 1946 are notional only, since all officers received "consolidation additions" to bring them up to the inclusive salaries shown. The scales have since been consolidated at approximately the inclusive figures.

(ii) The 1946 scales are London rates which are subject to deductions for provincial differentiation, amounting, according to locality, to £15 or £30 at the lowest point and ranging up to £42 or £85 at the highest. The 1936 and 1938 rates were not subject to provincial differentiation.

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Slaughterhouses

Mrs. Corbet asked the Minister of Food whether he will now allow local authorities to proceed with plans for building new slaughterhouses.

Mr. Strachey: I am glad to say that I have secured the agreement of my right hon. Friends the Ministers of Health and Agriculture to a slight modification of the present arrangements for England and Wales. It is the Government's intention to prepare plans for the marketing and distribution of all the main foods, as part of its long-term food policy; but no final decision on slaughtering policy can be taken for some time or will be taken until all the interests concerned have been consulted. Meanwhile, it would obviously be unwise to launch a far-reaching building programme, especially during the present shortage of labour and materials.

Meat rationing and consequently the control of slaughtering on present lines must continue for some time. It has therefore been decided that at certain points, where present facilities are seriously inadequate and where a public slaughterhouse would clearly fit in with any likely long-term scheme, local authorities should be encouraged to go ahead with plans for the erection of new slaughterhouses.

I must emphasize that only a comparatively small number of places will be affected, but we hope to secure a much needed improvement where conditions are particularly unsatisfactory at present, so far as is compatible with other demands on building labour and materials.

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Adulterated Milk

Mr. Alpass asked the Minister of Health if he will call the attention of local authorities to their powers under the Food and Drugs Act, 1938, Section 22, and the amended Food and Drugs (Milk and Dairies) Act, 1944, Section 3, to serve a notice on those offenders who adulterate milk to attend before them and show cause why their registration should not be cancelled.

Mr. J. Edwards: I have no reason to believe that local authorities are not exercising these powers.

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Poultry Industry (Government Policy)

Sir Waldron Smithers asked the Minister of Agriculture if he has considered the details, which have been sent to him, concerning increased production in the poultry industry; and if he will make a statement of Government policy in this matter.

Mr. T. Williams: I have read these proposals with interest. As they have been published they will no doubt be considered by the national poultry organizations. I am ready to consider any representations from those organizations about these proposals or in regard to the general welfare of the poultry industry.

Sir W. Smithers: In view of the fact that the promoters of this scheme have put forward concrete proposals, will the Minister undertake to have a conference or a meeting with these people, together with his advisers so as to see what can be done over the whole country?

Mr. Williams: Immediately the poultry industry requests a meeting I shall be quite ready to consider the matter.

Mr. Skeffington-Lodge: Are the buff and white orpingtons affected by what the hon. Member opposite has said?

Sir W. Smithers: In asking the Minister to ignore that question, may I urge him to take the lead and to give serious consideration to the proposals put forward?

Mr. Williams: I have already explained to the hon. Member that the moment the poultry organizations have had time to examine the proposals, which are very comprehensive and could not fail to require a major Parliamentary Measure, I shall be very happy indeed to meet them.

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Streptomycin Tests (Cats)

Mr. Viant asked the Secretary of State for the Home Department whether the cats to be used for tests with streptomycin, on behalf of the Medical Research Council, will be allowed to recover from the effects of the anaesthetic, in order that the result of the experiment may be seen.

Mr. Ede: In the tests to which I think my hon. Friend refers, the cats are not allowed to recover from the anaesthetic; but it is not accurate to describe these tests as being carried out on behalf of the Medical Research Council.

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Rinderpest, Tanganyika

Mr. C. Smith asked the Secretary of State for the Colonies what steps are being taken in East Africa to prevent the spreading of rinderpest to cattle by wild game; what steps are being taken to control game that is driven from the groundnut areas in Tanganyika territory; and what consideration has been given in East Africa to the methods used in Southern Rhodesia to protect farming areas from damage and disease carried by game; and with what result.

Mr. Creech Jones: I will ask the Colonial Governments concerned for a report on these matters and will write to my hon. Friend when it is received.

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Tsetse-Infested Areas, East Africa

Mr. Dodds-Parker asked the Secretary of State for the Colonies to what extent work in reclamation of tsetse-infested areas in East Africa will be affected by clearing of bush under the groundnut scheme and whether, as a result of that scheme, the provision under Item 126 in Colonial Research Reports, 1946-47, can be reduced.

Mr. Creech Jones: The tsetse-infested areas which the Tanganyika Government has in view for purposes of reclamation are not, so far as I am aware, affected by reclamation under the groundnut scheme and such reclamation measures are, in any case, financed from territorial resources. The provision under Item 126 in Colonial Research Reports, 1946-47, is for tsetse and trypanosomiasis research and experimental reclamation and the answer to the second part of the Question is, therefore, in the negative.

NOTES AND NEWS

Diary of Events

Aug. 20th.—Summer Meeting of the Eastern Counties Division, N.V.M.A., at King's Lynn (see Notice), 11.30 a.m.

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Ministry of Agriculture—Veterinary Appointments

The Meat Trade's Angle: "A Lamentable Position"

Contributing to current correspondence in *The Times* on the subject of food production in Great Britain, Mr. John Edwards, Treasurer of the National Federation of Meat Traders and Past President of the London Meat Traders' Association, writes as follows:—

Sir,—It is extremely surprising to learn from the letter which you published from the National Veterinary Medical Association that the Ministry of Agriculture has failed to reach agreement with the profession on the salaries and conditions of service of its veterinary officers. To those who, like myself, are interested in the meat trade, such a position seems lamentable. During the next few years our home livestock industry has a wonderful opportunity of strengthening

its position in the United Kingdom meat market, but full success can only be achieved if the full resources of the veterinary profession are concentrated on assisting our farmers to reduce the heavy bill—£30,000,000 a year, it is estimated—which represents losses due to animal diseases.

To my mind the Ministry of Agriculture cannot hope to give the right lead to the farming community if its veterinary officers are consistently underpaid and, consequently, dissatisfied. Nor will the public interest be served if, as a result, a brake is put on the production of first-rate beef and mutton by home producers for the home market.

Yours faithfully,
JOHN EDWARDS.

102, Turnpike Lane,
Hornsey, N.8.

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R.C.V.S. Central Library for Animal Diseases

We are asked to announce that the Central Library for Animal Diseases, 10, Red Lion Square, London, W.C.1, will be closed for readers from Monday, September 1st to the 15th, re-opening on Tuesday, September 16th.

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The Economic Crisis: Target for Home Agriculture

The Prime Minister, in his statement in the House on Wednesday of last week announcing the measures which the Government propose to enable the country to pay its way and provision its people, intimated that imports of food from "hard currency" areas are to be reduced by about £144,000,000 a year, representing complete elimination of all purchases except "basic" foodstuffs, which are to be secured if possible from other areas. The essence of this section of the retrenchment plan is to reduce the cost of imported food by increasing home production by a fifth by 1951–52, a task which will call for 100,000 extra workers on the land and a large capital outlay.

State Aid for Agriculture

In reference to this target of an extra £100,000,000 of food by 1951–52, Mr. Attlee said: "Agriculture is a great potential dollar-saver. We must produce a great deal more of our food at home to replace imports which we can no longer afford to buy, especially expensive dollar imports. The Government are setting a high target before agriculture—nothing less than an extra £100,000,000-worth of food by 1951–52, an increase of 20 per cent. on present output. I realize that that is a tremendous task. It will involve an immense effort, not only on the part of the agricultural community but of the Government themselves who will have to see that the industry is provided with the tools for the job.

"Much more labour will be needed on the land. Houses, hostels, and the supply of agricultural machinery must be speeded up. Do not let us forget that agriculture is a highly mechanized industry. The maximum supply of feeding-stuffs must be obtained. I do not accept the point about bad buying. (This in reply to an allegation made by Mr. Oliver Stanley in his opening speech.) We have been doing our utmost to get feeding-stuffs. Our buyers are still business men. There are skilled expert buyers at the Ministry of Food, and they probably know better than the right hon. gentleman the member for West Bristol. We must get our production of beef, bacon, and eggs expanded rapidly; we must remove all hindrances to production; and we must have sufficient man-power. We are depending far too much to-day on prisoner-of-war labour.

"We have suspended the call-up of young men from agriculture. But we shall need 100,000 workers, a big capital outlay, and heavy commitments on the part of agricultural producers. The Government will take account of that and the Minister of Agriculture will announce this month the new scales of prices for future production. This will give farmers confidence to embark on expanding production and provide them with the additional resources required. The county and district agricultural committees will be asked to take the lead. I appeal with confidence to the organizations of farmers and workers, and all sections of British agriculture, to renew the spirit, enterprise, and effort which earned it the admiration of all during the war.

"I am appealing to workers on the land. There must be many thousands of young men and women with inclinations, and often with the upbringing, to fit them for life on the land. We must get the prospects right. We are providing more houses in the rural areas than under any previous programme; hostels, technical education facilities, with chances to improve position, and small-holdings policy for those suitable for and anxious to take up this work. There are big opportunities. We are appealing to women as well, either through direct employment or the Women's Land Army, and we are appealing to men either directly or through the agricultural executive committees. In our new drive for greater production first things must come first. Food is basic, and therefore we must make this appeal to all in agriculture."

Following a two-day debate on the Government's proposals, and after Mr. Eden had criticized them on the ground of inadequacy, the House divided on the adjournment motion, which was carried by 318 votes to 170, a Government majority of 148.

Agriculture Target "Inadequate"

In the course of his speech, Mr. Eden, who said there had been a decline in every section of agriculture except milk production, described as inadequate the Government's agricultural target of £100,000,000 output by 1951-52. It would only get us, four years hence, to the output of 1945. During the war great strides were made in the mechanization of agriculture, but many of the machines that the industry now possessed were idle for want of spare parts, and many more machines were needed. In spite of this shortage at home over £6,000,000 worth of agricultural machinery was exported last year and over £3,500,000 worth had gone oversea this year. Was production or food at home a No. 1 priority or was it not? Our home needs must come first. In regard to livestock we had been retarded by want of feeding-stuffs. We had been infinitely less successful in obtaining them than anybody else. Feeding-stuffs were available to an increasing extent in the world to-day. The feeding-stuffs position would be enormously eased for our farmers if they were allowed to retain from this year's harvest 20 per cent. of their wheat and barley for stock and poultry rationing.

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PERSONAL

A Cambridge Fellowship.—Among those recently elected into fellowship at King's is Mr. R. R. A. Coombs, B.SC. (EDIN.), M.R.C.V.S.

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Professorship of Animal Pathology at Cambridge

Appointment of Dr. W. I. B. Beveridge, of Sydney

Early this week announcement was made of the election of Dr. William Ian Beardmore Beveridge, D.V.SC. (Sydney), to the Professorship of Animal Pathology in the University of Cambridge—a post which has been in abeyance since Professor Dalling's translation to Weybridge in 1941 as Director of the Ministry's Veterinary Laboratory.

Dr. Beveridge, whose appointment dates from the second of this month, has just arrived in England following a nine-months' stay at the Pasteur Institute in Paris.

Educated at Sydney University, Dr. Beveridge was a member of the research staff of the MacMaster Animal Health Laboratory in Sydney from 1931-41, except for two years spent as the holder of a Commonwealth Fund Fellowship at the Rockefeller Institute in Princeton and the Bureau of Animal Industry in Washington. It was in 1941 that he secured his doctorate in Sydney for work on foot-rot in sheep. The ensuing years have been spent at the Walter and Eliza Hall Institute at Melbourne, where, during the war, Dr. Beveridge conducted medical research into human virus diseases.

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ANOTHER CASE OF RABIES IN AN IMPORTED DOG

The Ministry of Agriculture and Fisheries reports the occurrence of a further case of rabies in an imported dog. The dog—a dachshund about two years of age—was brought to this country at the end of April from India. The animal, which died within three days of the first signs of illness, had been extremely nervous and excitable but rabies was not suspected until a *post-mortem* examination had been carried out.

As in the last nine months there have been four cases of dogs developing rabies whilst in quarantine, the value of the regulations which require all such animals to be kept in approved quarantine kennels for six months after landing in Great Britain will be obvious to all.

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CARDIGAN DEMANDS MORE PRACTITIONERS

At a recent meeting of the Cardiganshire branch of the National Farmers' Union at Aberayron a speaker raised the question of the shortage of veterinary surgeons in Cardiganshire, and stressed the need for appointing additional advisory veterinary surgeons on the staff of the Veterinary Department of the Ministry of Agriculture at Aberystwyth, in order to deal more expeditiously with applications for licences under the Attested Herd Scheme. The present position was far from satisfactory and the Ministry should make some arrangement with private veterinary surgeons if they were aiming at making Cardiganshire a 100 per cent. clean area. It was decided that the matter be referred to headquarters to take up with the Ministry of Agriculture.

POULTRY (STOCK IMPROVEMENT) ADVISORY COMMITTEE

At its meeting on July 23rd the Poultry (Stock Improvement) Advisory Committee received a report from its Sub-Committee dealing with Stock Improvement Schemes. Certain recommendations in this report for modifying the existing Accredited Breeding Scheme were endorsed in principle by the Committee and arrangements are now being made to obtain the views of the Organizations representing the Poultry Industry on these recommendations, which will not be published until they have been re-considered by the Poultry (Stock Improvement) Advisory Committee in the light of the views expressed by the bodies consulted.

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SWINE ERYSIPELAS VACCINE

The Veterinary Laboratory, Ministry of Agriculture, Weybridge, wishes to test under field conditions a single dose, living, avirulent vaccine against swine erysipelas. The vaccine can be obtained free of charge from Weybridge by members of the profession.

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SCHEME FOR THE CONTROL OF DISEASES OF DAIRY CATTLE

STATEMENT SHOWING THE NUMBER OF UNDERTAKINGS NOTIFIED TO THE MINISTRY OF AGRICULTURE DURING THE MONTH ENDED JULY 31ST, 1947

County	Undertakings Notified		Total Undertakings		
	During Month	Previously	Number	Number of Cattle	
				Cows	Heifers
ENGLAND					
Bedford	—	10	10	194	126
Berks	—	48	48	1,557	1,083
Bucks	—	26	26	699	697
Cambridge	—	—	—	—	—
Cheshire	3	138	141	4,774	1,972
Cornwall	—	—	—	—	—
Cumberland	—	9	9	387	304
Derby	—	223	223	6,391	3,644
Devon	6	119	125	1,839	1,317
Dorset	—	11	11	352	147
Durham	1	160	161	3,394	1,396
Essex	2	99	101	3,506	2,050
Gloucester	—	31	31	1,045	846
Hampshire	3	138	141	4,572	2,935
Hereford	—	5	5	163	137
Hertford	—	25	25	831	507
Hunts	—	—	—	—	—
Isle of Ely	—	—	—	—	—
Isle of Wight	—	—	—	—	—
Kent	—	71	71	1,587	1,116
Lancs.	2	83	85	2,600	1,044
Leics.	1	60	61	1,552	1,267
Lincs. (Holland)	—	—	—	—	—
Lincs. (Kesteven)	—	13	13	172	141
Lincs. (Lindsey)	—	13	13	394	398
Middlesex	—	2	2	34	25
Norfolk	1	53	54	1,645	1,195
Northants	—	23	23	595	616
Northumberland	1	34	35	1,170	814
Notts	—	111	111	2,643	1,505
Oxford	—	9	9	231	213
Rutland	—	1	1	24	12
Salop	1	59	60	1,954	1,148
Soke of Peterborough	—	—	—	—	—
Somerset	5	91	96	2,430	1,493
Staffs	2	95	97	2,834	1,928
Suffolk (East)	—	24	24	489	364
Suffolk (West)	2	22	24	484	401
Surrey	—	47	47	1,257	791
Sussex (East)	—	59	59	1,825	1,302
Sussex (West)	1	35	36	1,178	724
Warwick	2	64	66	1,668	1,272
Westmorland	—	3	3	51	21
Wilts	—	37	37	1,400	969
Worcester	1	78	79	1,537	869
Yorks (E.R.)	—	45	45	782	601
Yorks (N.R.)	—	55	55	1,241	866
Yorks (W.R.)	1	109	110	2,669	1,269
WALES					
Anglesey	—	10	10	161	115
Brecon	—	5	5	99	68
Caernarvon	—	26	26	480	209
Cardigan	—	29	29	599	406
Carmarthen	2	145	147	2,882	1,547
Denbigh	—	11	11	215	111
Flint	—	23	23	576	274
Glamorgan	2	34	36	566	297
Merioneth	—	6	6	93	31
Monmouth	—	8	8	165	123
Montgomery	—	1	1	6	—
Pembroke	—	7	7	197	235
Radnor	—	1	1	4	—
TOTALS	39	2,644	2,683	70,193	43,541

Notes.—(1) Operative periods of undertakings: 1 year, 737; 2 years, 157; 3 years, 1,789. (2) Undertakings renewed for further periods: 1 year, 16; 2 years, 1; 3 years, 3. (3) Undertakings not renewed at end of operative periods, 102. (4) The figures showing the number of undertakings notified during the month relate to entirely fresh undertakings and do not include undertakings renewed for further periods. Undertakings which have been cancelled or not renewed are not included in the figures for previous notifications.

County	Undertakings Notified	Total Undertakings		
	During Month	Previously	Number	Number of Cattle	
				Cows	Heifers
SCOTLAND					
Aberdeen	—	16	16	812	349
Angus	—	13	13	540	345
Argyll	—	—	—	—	—
Ayr	—	10	10	350	222
Banff	—	1	1	120	20
Berwick	—	1	1	22	7
Bute	—	—	—	—	—
Caithness	—	—	—	—	—
Clackmannan	—	1	1	19	14
Dumfries	—	12	12	617	564
Dunbarton	—	—	—	—	—
East Lothian	—	1	1	20	8
Fife	2	21	23	713	501
Inverness	—	1	1	47	20
Kincardine	—	1	1	40	55
Kinross	—	3	3	60	43
Kirkcudbright	—	5	5	733	697
Lanark	—	5	5	235	150
Midlothian	—	—	—	—	—
Moray	—	—	—	—	—
Nairn	—	—	—	—	—
Orkney	—	—	—	—	—
Peebles	—	—	—	—	—
Perth	—	9	9	274	214
Renfrew	—	4	4	151	101
Ross-shire	—	3	3	130	62
Roxburgh	—	—	—	—	—
Selkirk	—	—	—	—	—
Stirling	—	7	7	254	219
Sutherland	—	4	4	85	39
West Lothian	—	2	2	75	22
Wigtown	—	15	15	1,247	708
Zetland	—	—	—	—	—
TOTALS	2	135	137	6,544	4,360

Notes.—(1) Duration of undertakings: 1 year, 38; 2 years, 6; 3 years, 93. (2) Undertakings renewed for a further period (included in the second column of the statement): 1 year, 119; 2 years, 9; 3 years, 71. (3) Undertakings expired and not renewed (not included in the second column of the statement): 264. (4) The figures in the first column of the statement relate to entirely fresh undertakings.

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THE VETERINARY EDUCATIONAL TRUST

RESEARCH TRAINING FELLOWSHIP

Mr. Peter Kiddle, M.R.C.V.S., of the Royal Veterinary College, has been awarded a research training fellowship by the Veterinary Educational Trust for the purpose of undertaking research in Animal Husbandry at Cambridge.

Mr. Kiddle, who qualified M.R.C.V.S. from the London College in July, 1945, was appointed Junior Lecturer in Surgery at the College, and has held this post for two years. Whilst a student, he secured the First Centenary Prize, the Second Clinical Prize, and the Second R.A.S.E. Prize in his Final Year. He now wishes to specialize in Animal Husbandry, and hopes to go to Cambridge as soon as arrangements can be made.

. . . . .

A FINE ART BROCHURE

Mr. Walter Hutchinson, a trustee of the Veterinary Educational Trust, has produced on behalf of the Trust a most attractive and instructive booklet designed to stimulate interest in veterinary research, science and practice.

In order to illustrate the brochure, printed partly in colour and partly in black and white, Mr. Hutchinson has based the appeal of this booklet upon the first-rate reproduction on art paper of several famous pictures in the National Gallery of British Sports and Pastimes, his own personal collection, and others in the Ackermann, Tate, Lever and Walker Galleries.

The coloured illustrations include a George Stubbs' landscape of a horse and two dogs; Sarah Ferneley's view of Melton Mowbray; a mixed farm scene with stock of many kinds, painted with accuracy of breed conformation by J. F. Herring, Senior; a Birket Foster showing cottagers loading their produce for market; a striking Thomas Weaver painting of the foundation Shorthorn bull Patriot, and Holman Hunt's "Hireling Shepherd," a pastoral scene of great beauty. The black and white reproductions include an Albert Cuyp landscape with cattle; Landseer's brilliant painting of "The Maid and the Magpie," and one of Henry Alken's racing scenes, "The Winning Post."

These pictures, by contrast with the farm stock of to-day, show how much progress has been made in the improvement of our farm animals, but a great deal still remains to be done, and under the slogan "Good Health!" the text of the brochure stresses, with reference to the type of animal illustrated, the facts that the reduction of ill-health, the greater comfort and the increased productivity of our animals, are three reasons why the Veterinary Educational Trust was brought into being in 1942, and that the

nation needs more veterinary surgeons, better facilities for their training, greater opportunities for specialization in research and practice, and increased scientific knowledge and its better application "in the field."

Readers wishing to obtain a copy of Mr. Walter Hutchinson's illustrated brochure which explains many of the objects of the Veterinary Educational Trust, should make application to Sir Cleveland Fyfe, C.B.E., Organizing Secretary, 232/235, Abbey House, Victoria Street, London, S.W.1.

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The Veterinary Educational Trust will have a demonstration stand—No. 104—at "The Country Comes to Town" exhibition which is to be staged in Stanley Park, Blackpool, from August 20th to September 6th next. On this 15-acre site, British food as it is produced, processed and presented for sale will be the main "theme" of the exhibition.

* * * * *

The Bloodstock Industry Committee of the Trust has received a gift of 300 guineas from Mr. Joseph J. McGrath, Brownstown Stud Farm, Curragh, Co. Kildare, in lieu of a nomination to the stallion Windsor Slipper.

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ADDRESSES OF DISEASE-INFECTED PREMISES

The list given below indicates, first, the county in which are situated the premises on which disease has been confirmed, followed by the postal address and date of outbreak.

SWINE FEVER:

Lincs. (*Lindsey*).—Moor Farm, Reepham, Lincoln (Aug. 8th).

CORRESPONDENCE

The views expressed in letters addressed to the Editor represent the personal opinions of the writer only and their publication does not imply endorsement by the N.V.M.A.

Correspondents should write as briefly as possible and letters should not exceed 350 words.

DO "ARTIFICIALS" DE-VITALIZE?

Sir,—I have a clear recollection of events that occurred 70 years ago, and as a small boy I remember on summer evenings watching the horses released from their vehicles after their day's work, kicking and jumping and careering round the yard to the water trough before entering the stables.

These horses were of the old-fashioned Clydesdale type; they hauled heavy loads and fed on the produce from well-cultivated farms on which rotted horse manure was used, and no artificial fertilizers.

The farmers of that period knew by experience that rotted manure was the best method of applying manure, as unrotted manure in the process of decomposition actually feeds on the soil before it becomes available for plant life through the living organisms in the soil.

I heard remarks that "so and so is a bad farmer; he puts very little into the land and takes everything out of it." He had been exhausting the fertility of the soil and horses did not thrive on the hay and oats from his farm.

About two months ago, on a farm where pedigree Clydesdales are bred and a considerable quantity of chemical fertilizers is used, an elderly carter with whom I was in conversation casually remarked that the Clydesdales of to-day had not the life in them that the horses in his young days had, when they would come jumping from the fields at the end of the day's work—"to-day you have to knock them along."

These remarks may be of interest to nutrition and health experts and racehorse owners.

Yours faithfully,

The Anchorage, A. HART.
Ardnadam, Dunoon, Argyll.
July 12th, 1947.

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AETIOLOGY OF CANINE HYSTERIA

Sir,—Let me submit from the Antipodes some local evidence on the aetiology of canine hysteria.

Canine hysteria, as commonly observed in England, is extremely rare here: so rare that in nearly seven years of town and country practice I have not seen one typical case.

My information is that in Australia almost all flour is agenized by the ozone process and that, in fact, the employment of this process is now fairly general, except in some parts of England where the chlorine process is still used.

Consequently at least two inferences suggest themselves, one concerning the theory of Mellanby and the other concerning the theory of Tom Hare.

If, as Mellanby states, agenizing is the main cause of canine hysteria then it must be flour agenized by the chlorine process only that is the danger.

If, as Hare appears to think, the *Beta hæmolytic streptococcus* is the more potent factor, then either the B.H.S. is different here or is not active in the canine body at this end of the world.

Yours faithfully,

Deloraine, Tasmania. J. W. RAINEY.
June 15th, 1947.

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PROLONGED RECUMBENCY AFTER MILK FEVER

Sir,—In the treatment of these cases in recent years I have always used dextro-calcium and have had few instances where the cows have failed to rise if they are on a comfortable bed and their heads are loose. I have seen some unsightly effects of sloughing where calcium boroglucosin has been employed. Farmers have objected to its use. The advantages of injections of 60 c.c. of a 20 per cent. solution of dextro-calcium are that the dose is not bulky and is not followed by sloughing if syringes are clean. The majority of German veterinary surgeons used this method for recumbency after milk fever and for its treatment and in a few cases a blister applied to the hocks affected a cure.

Yours faithfully,

Bolton. G. MAYALL.

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ASCERTAINING "REPRESENTATIVE" OPINION

Sir,—By now it must be obvious to even the most casual reader of the *Record* that the N.V.M.A. Divisions are opposed to the Ministry's salary scales.

That is an opinion that I do not wish to dispute but can we assume, as does the N.V.M.A.'s statement of July 19th, that the majority decisions of such meetings necessarily represent the majority opinion of the profession, or that they can *possibly* provide a representative cross section of the profession's views, including those of the recent graduates?

I can only say that, in my own case, I have had the opportunity in the past 18 months to attend two meetings of an N.V.M.A. Division. In the same period my principal has, I believe, attended some eight or ten meetings. Since my chances of attending are so few I have not become a member of the local Division, and so when I am present it is as a "visitor" without voting power.

Many of my fellow graduates have told me that their position is very similar to my own.

The few meetings which I have been able to attend have consisted very largely of *established* practitioners and, of the few younger members present, the majority, like myself, have been "visitors" without voting power, and yet it is meetings such as these which are said to "clearly indicate . . . the almost complete unanimity" of the profession.

We, as a profession, will, during the next few years, have to make a number of fundamental decisions, deciding, for example, the function of the State in large-animal practice; whether we should work within a State Service; whether we should form ourselves into a corporate body, as outlined by Dr. Wooldridge, or whether we can effect a compromise between these two solutions, and I suggest, Sir, that when the time for such decisions comes, we should ascertain the opinion of the profession by means of a plebiscite instead of relying on the N.V.M.A. Divisions.

Yours faithfully,

"G. E."

Revision of Rates for Classified Advertisements

The attention of those concerned is directed to the announcement, appearing on advertisement page vi of this issue, in which are detailed new rates for the insertion of classified advertisements in *The Veterinary Record*.

The introduction of these increased charges—also of an addition to the Box Number fee—has been decided upon, with regret, as one of the measures essential to meet the very heavy increase in the cost of printing the journal of the Association.

The new rates specified will be payable in respect of all professional and other "small" advertisements published in the September 6th and subsequent issues.

Alterations, as notified direct to advertisers, also will be made in the rates for "display" announcements.